

WHAT IS CLAIMED IS:

1. A plant cultivation system for growing terrestrial plants in saline water, comprising:
 - a plant support comprising a buoyant portion; and
 - at least one terrestrial plant in contact with the plant support, wherein the plant support is buoyant in the saline water, and wherein and at least a portion of the plant contacts the saline water.
2. The system of claim 1, wherein the saline water comprises water selected from the group consisting of seawater, brackish water, lake water, groundwater, pondwater and water in a reclamation, remediation, or cropping system.
3. The system of claim 1, wherein the saline water is in a location selected from the group consisting of open ocean, a coastal area, an estuary, a delta, a pond, a sump pond, a lake, an aquifer, a water reclamation facility, a phytoremediation site, a harbor, a marine agriculture farm, and a desalination facility.
4. The system of claim 1, wherein the saline water further comprises a contaminant selected from the group consisting of a pesticide, an organic pollutant, a PCB, a hydrocarbon, a metal ion, nitrogen, phosphorous, and potassium.
5. The system of claim 1, wherein the metal ion is selected from the group consisting of lead, mercury, cadmium, arsenate, copper, and zinc.
6. The system of claim 1, wherein the plant support comprises a sheet material in contact with a buoyant edge or frame.
7. The system of claim 1, wherein the plant support comprises a growth medium.
8. The system of claim 7, wherein the growth medium is at least partially contained in a housing.
9. The system of claim 8, wherein the buoyant portion is selected from at least one of the group consisting of: the growth medium and the housing.
10. A buoyant platform for growing terrestrial plants in saline water, comprising:
 - a sheet capable of being suspended at or near a surface of a body of saline water;
 - at least one buoyant support member in contact with the sheet; and

at least one terrestrial plant, plant part, or seed positioned in contact with the sheet such that at least a part of the terrestrial plant, plant part, or seed can also contact the saline water.

11. The buoyant platform of claim 10, wherein the at least one buoyant support member forms a supporting structure for the platform.

12. The buoyant platform of claim 10, wherein the buoyant support member comprises a material selected from the group consisting of a natural material, a synthetic material, wood, bamboo, plastic, polypropylene, steel, fiberglass, foam, plastic, and rubber.

13. The buoyant platform of claim 10, wherein the sheet comprises a material selected from the group consisting of: shade cloth, a plastic film, netting, a textile, ground cover, screen, a woven material, a nonwoven material, bubble wrap, and styrofoam.

14. The buoyant platform of claim 10, wherein a space for growth of a terrestrial plant is present in a region between two buoyant support members.

15. The buoyant platform of claim 10, further comprising an irrigation system.

16. The buoyant platform of claim 15, wherein the irrigation system delivers a liquid comprising at least one member of the group consisting of evaporative water, rainwater, transpiration water, and freshwater.

17. The buoyant platform of claim 16, wherein the irrigation system further delivers at least one material selected from the group consisting of: a fertilizer, a nutrient, a mineral, and a plant growth regulator.

18. The buoyant platform of claim 17, wherein the irrigation system further comprises means of collecting irrigation water, wherein the irrigation water has a lower salinity than the saline water.

19. The buoyant platform of claim 17, wherein the irrigation system further comprises means of storing the irrigation water.

20. A buoyant platform for growing terrestrial plants at a surface of a saline body of water, comprising:

at least one growth medium capable of being suspended at a surface of the saline body of water, wherein the growth medium comprises at least one terrestrial plant, plant part, or seed; and

at least one buoyant support member supporting the growth medium.

21. The buoyant platform of claim 20, wherein the growth medium comprises at least one substance selected from the group consisting of: peat, peat moss, an artificial soil component, natural soil, a soil amendment, a hydrophobic particle, an organic fertilizer, and a plant growth nutrient, and manure.

22. The buoyant platform of claim 20, wherein the growth medium is contained in a housing, the housing comprising a material selected from the group consisting of: shade cloth, a plastic film, netting, a textile, ground cover, screen, a woven material, a nonwoven material, bubble wrap, and styrofoam.

23. The buoyant platform of claim 20, wherein an evaporation-protective layer is provided at a surface above the growth medium package to inhibit contact of the growth medium with air.

24. A method of growing a terrestrial plant in saline water, comprising:
providing a buoyant growth platform capable of being suspended at a surface of a body of saline water;
placing plant material in the platform, such that at least a portion of the plant material is contacted by the saline water; and
growing at least one plant from the plant material while the platform is afloat in the saline water.

25. The method of claim 24, wherein the plant material is selected from the group consisting of a seed, a cutting, a root, a whole plant, and a tuber.

26. The method of claim 24, wherein the plant material is contacted with the saline water by at least one of the group consisting of: direct contact, wicking, and irrigation.

27. The method of claim 24, further comprising harvesting from the growth platform at least one item selected from the group consisting of: a whole plant, a plant part, an inflorescence, a fruit, a flower, a seed, pollen, a leaf, a root, a tuber, a meristem, and a shoot.

28. The method of claim 27, further comprising use of the harvested plant material in a product or process selected from the group consisting of: food, oil extraction, fiber, fuel, spice, herbal formulation, a nutraceutical, a pharmaceutical, an economic crop, a phyto-salt, bioremediation, contaminant sequestration, a feed, a dye, a building material, and an industrial raw material.

29. The method of claim 24, wherein the plant is selected from the group consisting of: *Salicornia* spp., *Rhizophora mangle*, *Batis maritime*, *Sesuvium portulacastrum*, *Myoporum sandwicense*, *Thespesia populanea*, and *Scaevola taccada*.

30. The method of claim 24, wherein the plant is a cultivated crop plant.

31. A method of improving a quality of a body of saline water containing an undesired substance, comprising:

providing a buoyant growth platform capable of being suspended at a surface of a body of saline water containing an undesired substance;

placing plant material in the platform, such that at least a portion of the plant material can be contacted by the water; and

growing the plant material in presence of the water;

removing the substance from the water, through accumulation of the substance in the plant material.

32. The method of claim 31, wherein the substance comprises an organic compound, diesel fuel, gasoline, a metal, a pesticide, an organic pollutant, a PCB, a metal ion, nitrogen, phosphorous, potassium.

33. A method of bioremediation of a ground area containing an undesired substance, comprising:

providing a sump pond, comprising water, at a low point of a ground area, wherein the ground area contains an undesired substance;

providing a buoyant growth platform capable of being suspended at a surface of a the sump pond;

placing plant material in the platform, such that at least a portion of the plant material can be contacted by the water; and

growing the plant material in presence of the water;

removing the substance from the water, through accumulation of the substance in the plant material.

34. The method of claim 33, wherein water is added to the pond by leaching the ground area with water.

35. The method of claim 33, wherein the plant material is harvested.

36. The method of claim 33, wherein steps of the method are repeated.

37. A method of improving a saline fish habitat, comprising:
providing a buoyant growth platform capable of being suspended at a water surface of a saline fish habitat;
placing plant material in the platform, such that at least a portion of the plant material can be contacted by the water; and
growing the plant material in presence of the water under conditions permitting the growing plant material to improve the fish habitat.

38. The method of claim 37, wherein the plant growth permits at least one improvement selected from the group consisting of: providing a food source to the fish, providing shelter to the fish, encouraging formation of a community of organisms beneficial to the habitat, removing an undesired substance from the water, and depositing a desired substance into the water.

39. A method of protecting land from seashore erosion, comprising:
providing a buoyant growth platform capable of being suspended in saline water adjacent a seashore;
placing plant material in the platform, such that at least a portion of the plant material can be contacted by the water; and
growing the plant material in presence of the saline water to produce a break to protect against seashore erosion.

40. The method of claim 39, wherein the break has at least one function selected from the group consisting of: a wind break, a wave break, a fish sanctuary, and a landscaping feature.

41. A method of desalinating saline water, comprising:
providing a buoyant growth platform capable of being suspended in saline water adjacent a seashore;
placing plant material of an ion-accumulating plant in the platform, such that at least a portion of the plant material can be contacted by the water; and
growing the plant material in presence of the saline water such that a salt ion is accumulated in the plant material and removed from the water.

42. The method of claim 41, wherein the ion is at least member of the group consisting of: sodium, phosphorous, potassium, nitrogen, sulfur, and boron.

43. The method of Claim 41, wherein the ion-accumulating plant is *Sesuvium portulacastrum*.

44. A method of screening a plant variety for an ability to thrive in saline water, comprising:

providing a buoyant growth platform capable of being suspended in saline water;

determining a first measure of at least one characteristic of material of a test plant variety;

placing the plant material in the platform, such that at least a portion of the plant material can be contacted by the saline water;

allowing a period for growth of the plant material;

thereafter determining a second measure of the at least one characteristic of the plant material; and

assessing ability of the plant material to thrive in saline water based upon a comparison of the first measure and the second measure.

45. The method of claim 44, wherein the characteristic comprises at least one member of the group consisting of: biomass, size, shape, color, protein content, sugars content, growth rate, and developmental stage.

46. The method of claim 44, wherein material of the test plant variety is subjected to mutagenesis prior to or during growth.